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In re Application of:

YOUNG-TAEK SUL

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Sir:

1. I am YOUNG-TAEK SUL, a citizen of Republic of Korea, having residence at Department of Biomaterials Sciences, Goteborg University, Box 412, S-405 30 Goteborg, SWEDEN, hereby declares as follows:

2. I received my Baccalaureate degree in Dental Surgery from Seoul National University in 1987 and my Doctor degree in implant science from Gothenburg University in 2002.

I am an associate research professor, Department of biomaterials/Handicap Research, Institute for Clinical Science at Shalgrenska Academy, the Gothenburg University, Sweden. I received my Ph.D. degree in Implant Science from the same University in 2002. Young-Taeg Sul is the author and co-author to some 60 peer-reviewed abstracts and papers in international journals. I have made several oral presentations at national- and international conferences. I am frequently involved in referee tasks for several international scientific journals including *Int J Oral Maxillofac Implants, Acta Biomaterials, Biomaterials, J. Electrochemical Society, Electrochemical and Solid-State Letters, and J. Biomedical Materials Research.* My early activity as a dentist focused on clinical research of titanium implants but my research interests over the years have focused on the areas of surface engineering, surface characterization, evaluation methods (experimental and clinical). I have invented surface innovation methods (US Patent 7291178, SE 0104213-4) that are applied to commercial products of the three companies to improve clinical performance of the bone implants. The method is about cations incorporation in the valve metals by the anodic process (So far, it has been found that anions are incorporated). Using the cations, Mg^{2+}, Ca^{2+} incorporated metal surfaces that

reinforced significantly rapid and stronger implant integration to bone. I have proposed a new theory of the implant-to-bone integration, biochemical bonding mechanism.

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3. I have been practiced in this field for approximately 18 years.

4. I am an inventor of the above-referenced application.

5. I declare and submit evidence establishing that a helical implant formed with 150 μm micro-patterns on thread inclines promotes bone mineralization and maturation.

6. FIGS. 1-3 are histomorphomertic and fluorescence microscopic photos showing animal bone growth in 150 μm micro-patterns constructed as embodiments according to the principles of the invention, at the healing time of 6 weeks.

7. In FIG. 1, the 150 μm micro-patterns are formed at the conical 1/3 area of the implant. Fluorescence agents such tetracycline (15mg/kg body weight, Fluka, Buchs, Switzerland), alizarin-complexon (30mg/kg body weight, Fluka, Buchs, Switzerland), calcein blue (30mg/kg body weight, Fluka, Buchs, Switzerland), were injected in the animals at 2, 4 and 6 weeks in order to show the bone growth. FIG. 1 clearly shows the bone growth into the 150 μm micro-patterns at the conical 1/3 thread of the screw implant.

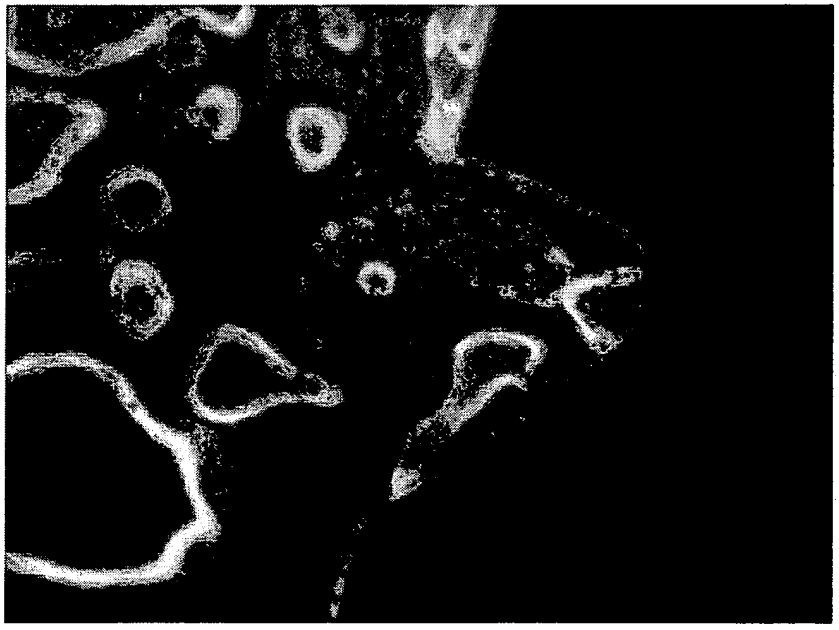

FIG. 1

8. In FIG. 2, the 150 μm microthreads are formed at the middle 1/3 area of the implant. FIG. 2 clearly shows the bone growth into the 150 μm micro-patterns at the middle 1/3 thread of the screw implant.

FIG. 2

9. In FIG. 3, the 150 μm microthreads are formed at the apical 1/3 area of the implant. FIG. 3 clearly shows the bone growth into the 150 μm micro-patterns at the apical 1/3 thread of the screw implant, where the bone tissue and microthread was surrounded with bone marrow tissue.

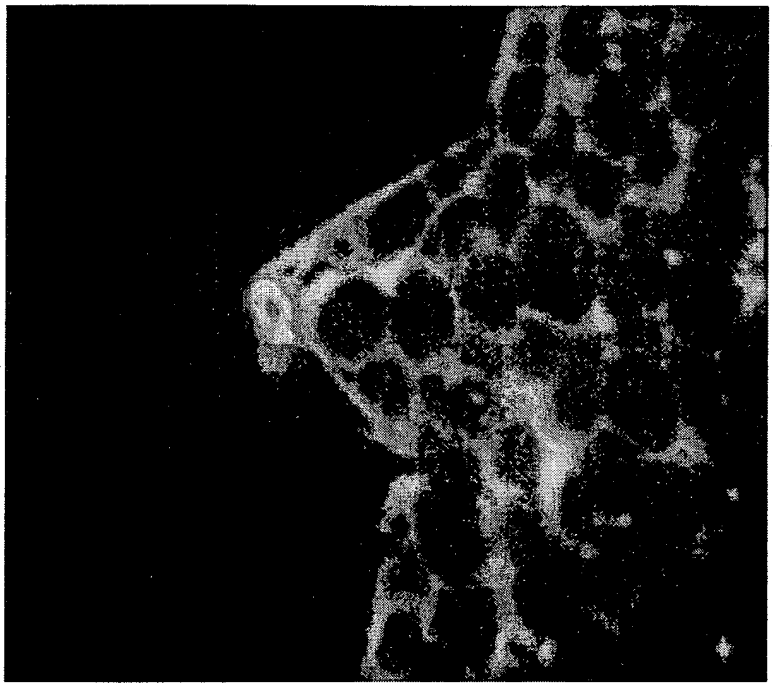

FIG. 3

10. As shown in FIGs 1-3, after the helical implant which is formed with micro-patterns with a distance of 150 μm, is implanted into the animal bone tissue, the bone grew into the thread.

11. The 150 μm micro-pattern provide optimal site for bone ingrowth. Particularly, in a bone system such as a Haversian system in which Haversian canals surround blood vessels, the 150 μm micro-pattern may promote bone mineralization and eventually maturation. As a consequence, the strength and speed of an osseointegration, i.e., direct structural and functional connection between the bone and the surface of the implant, will be increased.

I HEREBY DECLARE that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under §1001 of Title 18 U.S. Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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